



USDA Foreign Agricultural Service

# GAIN Report

Global Agriculture Information Network

Template Version 2.09

Required Report - public distribution

**Date:** 7/28/2005

**GAIN Report Number:** BM5018

## Burma

## Biotechnology

## Agricultural Biotechnology

## 2005

**Approved by:**

Russ Nicely, Acting Agricultural Counselor  
U.S. Embassy, Bangkok

**Prepared by:**

Daphne Khin Swe Swe Aye, Agricultural Specialist

---

**Report Highlights:**

Burma at present does not have a national policy on biosafety and is in the process of formulating one with assistance from the U.N. It does participate in the Framework Agreement on Biosafety in ASEAN and has agreed to implement Protocol 8 on Sanitary and Phytosanitary Measures to implement the ASEAN framework agreement on the facilitation of goods in transit.

---

Includes PSD Changes: No  
Includes Trade Matrix: No  
Unscheduled Report  
Bangkok [TH1]  
[BM]

<b>SECTION I:</b>	<b>EXECUTIVE SUMMARY . . . . .</b>	<b>3</b>
<b>SECTION II:</b>	<b>BIOTECHNOLOGY TRADE AND PRODUCTION . . . . .</b>	<b>4</b>
<b>SECTION III:</b>	<b>BIOTECHNOLOGY POLICY . . . . .</b>	<b>5</b>
<b>SECTION IV:</b>	<b>MARKETING ISSUES . . . . .</b>	<b>7</b>
<b>SECTION V:</b>	<b>CAPACITY BUILDING AND OUTREACH . . . . .</b>	<b>7</b>
<b>SECTION VI:</b>	<b>REFERENCE MATERIAL . . . . .</b>	<b>7</b>

**SECTION I: EXECUTIVE SUMMARY**

Burma at the present moment does not yet have a National Policy on Biosafety. It is in the process of formulating a National development policy and setting priorities, to include biotechnology. Burma has participated in the formulation of the Framework Agreement on Biosafety in ASEAN and has agreed to implement Protocol 8 on Sanitary and Phytosanitary measures to implement the ASEAN Framework Agreement on the Facilitation of Goods in Transit. However, there are some laws existent, such as the Pesticide Law, the Plant Pest Quarantine Law, and the Animal Health and Development Law, which are more or less related to biosafety issues.

Burma does not have regulatory controls on the imports of GM food or food products. There is no infrastructure set up to regulate the commercialization of GM food. Thus, it is very possible that Burma has animal feeds, foods, and food ingredients, such as soybean and corn, which were derived from genetic engineering. There is no information available on the plantation of GM crops in Burma, but it is possible that seeds obtained from neighboring countries, particularly China and India, may be GM seeds.

Burma has not developed any institutional framework or biosafety policy, guidelines or regulations, and also has not developed any mechanisms to prohibit the commercial sale of food if GM in origin.

The project to formulate a National Biosafety law was funded by the United Nations Environment Program and Global Environment facility in 2004 and will terminate in November 2005. This National biosafety framework is to be formulated in accordance with the relevant provisions of the Cartagena Protocol on Biosafety. The main elements to be included will be a regulatory system, an administrative system, a decision-making system that includes risk assessment and management, and a mechanism for public participation and information. The formulation of the Burmese bio-safety law is intended to ensure an adequate level of protection for safe transfer, handling, and use of living modified organisms resulting from modern biotechnology, that may have an adverse effect on the conservation, and on sustainable use of biotechnology diversity while taking into account the risk to humans, specially focusing on trans-boundary movements.

Burma does not have a Seed Law. The Myanmar Academy of Agricultural, Forestry, Livestock and Fishery Sciences is in the process of drafting the Seed Law. Burma also lacks relevant food safety regulations, and imports many seeds and foodstuffs from neighboring countries and elsewhere.

BT Cotton, from GM seeds from India, has been on trial for four years in Mandalay Division. Trials have shown BT cotton to be adaptable to Burma's soil and climate.

A national Biotechnology Development Center was established in 2004 at Patheingyi University, Irrawaddy Division in collaboration with the National Institute of Technology and Evaluation of Japan. Yangon Technological University has offered some limited programs in biotechnology since 1998 – a research program into the effects of indigenous plant products on the treatment of malaria in laboratory animals, and a post-graduate diploma training in aquaculture technology.

**SECTION II: BIOTECHNOLOGY TRADE AND PRODUCTION**

Burma's economy is based on agriculture and most of its exports are agricultural products such as rice, maize, beans and pulses. Nevertheless, productivity on these crops is relatively low compared to major producing countries such as Vietnam and Thailand. Since it has been unable to overcome many constraints in achieving greater productivity in yields per acre, Burma has concentrated on increased acreage to increase output. This primitive method is not sustainable in the long run. In order to overcome these shortcomings, biotechnology is being examined in Burma with the objectives to increase crop yields and to overcome the limitations of conventional plant breeding methods.

Agriculture biotechnology in Burma now is mostly at the plant tissue culture level. Under the supervision of the Ministry of Agriculture and Irrigation, there are four main tissue culture laboratories located in Mingaladon, Helgu, Nyaung Hnit Pin (Hmawby) – all under the Myanmar Agriculture Service, and also in Yezin - under the Department of Agricultural Research (DAR).

Micro-propagation is being carried out mainly in orchids and some in banana, pineapple and medicinal aloe plants at the Department of Agriculture Research (DAR) under the Ministry of Agriculture and Irrigation, and is among the highest level of agricultural technology currently in application within Burma. Attempts are also made to produce virus free plants in potato, banana and strawberry using in vitro techniques. In rice, another culture technique is utilized to produce double haploid breeding lines in order to shorten the breeding cycle. While applying tissue culture techniques, somaclonal variants were identified and studied in rice, sugarcane and peanut. For the improvement of indigenous crop varieties and to identify variants in ornamental plants in vitro nuclear techniques were utilized with the cooperation of Atomic Energy Agency (Burma).

Recently, isozyme analysis and SDS (PAGE) analysis were carried out to distinguish among rice and peanut varieties at the Department of Agriculture Research Institute (DAR). In the future, DAR expects to apply molecular analysis methods to enhance conventional plant breeding, phyto-sanitation, and probably in the utilization of transgenic crop varieties.

Myanmar Cotton and Sericulture Enterprise, of the Ministry of Agriculture and Irrigation, has been doing research on BT cotton, with a GM seed from India, for four years at the Lun Kyaw Cotton Research Farm at Kyaukse District, Mandalay Division. Trials have proved to be successful and the crop adaptable to Burma's environment, but seeds have not been released commercially.

The Biotechnology Development Center was established on 15 May 2004 at Patheingyi University, Patheingyi Township, Irrawaddy Division. The National Institute of Technology and Evaluation (NITE) of Japan and Patheingyi University signed an MOU and a project agreement on 26 March 2004 to establish the Biotechnology Development Center. Work began there in May, 2004 when scholars of NITE of Japan, together with the faculty members of Patheingyi University, undertook biotechnology research work for production of medicine and personal goods from soil and plants, and carrying out research on microorganisms for agricultural purposes. They were able to identify 1,835 microorganisms, including 26 items of microorganisms that can be used in production of glucose from rice, potato, maize and tapioca, five items of microorganisms that can fight against insects, and various kinds of microorganisms to be used in manufacturing medicines for hypertension, gout, liver and hepatitis B disease.

A laboratory at Nyaung Hnit Pin, Rangoon Township recently has been upgraded to provide DNA finger printing for imported crops such as rice and soybean seeds. This lab was jointly

funded by China and Japan, with the lab equipment provided by Japan while infrastructure such as the buildings was funded by China.

### **SECTION III: BIOTECHNOLOGY POLICY**

#### **Biosafety Law**

At present there is no biosafety law in Burma, but Burma is currently in the process of developing a national framework for biosafety. At the present time there is no regulatory controls on imports of GM foods or food products. Additionally, there is no infrastructure set up to regulate the commercialization of GM food. Burma is among the less advanced ASEAN members and lacks the necessary infrastructure for consumer education and protection. Research activity in this area is non-existent. The emerging issues are setting up a regulatory framework and safety assessment infrastructure to accommodate GM crops for planting or food. Burma also needs to develop a legal framework that can accommodate biosafety legislation.

Burma has been in the process of developing a National biosafety law. The United Nations Environmental Program and Global Environment Facility funded an 18-month project costing \$180,000 US dollars to develop such a law. The executing agency is the Department of Agricultural Planning, Ministry of Agriculture and Irrigation and nine Ministries are involved in this project:

- (1) Ministry of Education
- (2) Ministry of Livestock
- (3) Ministry of Agriculture and Irrigation
- (4) Ministry of Science and Technology
- (5) Ministry of Forestry
- (6) National Committee on Environmental Affairs
- (7) Department of Trade/ Ministry of Commerce
- (8) Ministry of Finance and Revenue
- (9) The Attorney-General's Office
- (10) Ministry of Health

In cooperation with the private sector, the above-mentioned Ministries and Departments will implement a soft law on Living Modified Organisms (LMO) to precede the full Biosafety law. A UNEP consultant, together with the officials from the Ministries and Departments involved in this project, will educate the private sector on awareness of, and the pros and cons of biosafety.

On May 5<sup>th</sup> and 13<sup>th</sup>, 2005, the 6<sup>th</sup> meeting of the National Biosafety Cooperation Committee Project and Data Gathering on Biosafety were held. Topics included status of implementation and status of gathering data and information. The 18-month project is expected to be completed by November 2005.

#### **Existing conditions for Biotechnology**

For the time being there is no scrutiny or checks on imported seeds and foodstuffs as Burma lacks a seed law and food safety regulations. It is an open market. No seed, feed or food importers voluntarily declare their imports are GM products. Burma still lacks the apparatus and technical experts to evaluate GM products.

For the time being Burma faces unpredictable results in agricultural production as most of the cottonseeds and paddy seed are imported unregulated from India and China. An official from the Ministry of Agriculture and Irrigation said that he suspected most of the cottonseed imported from India is GM seed. He also said that since China is also producing GM paddy seeds, it is likely in the near future that these GM paddy seeds will find their way to Burma since there are no barriers to entry of GM seeds, feeds, and foods.

In the animal sector, the involvement of biotechnology is not yet developed. There has been reports of improved breeding strains such as poultry and pigs being imported into Burma, along with animal pharmaceuticals – vaccines and medicines - as well as animal feeds. However, it is impossible to ascertain whether any of these materials contain GMOs.

The Department of Fisheries in Burma is responsible for the control of fishing in the country as well as in the coastal waters. The Freshwater Fisheries law of 1991, Aquaculture Law of 1989, Law relating to the Fishing rights of Foreign Fishing Vessels of 1989, and the Myanmar Marine Fisheries Law of 1990, were enacted to ensure sustainable fishery production but do not address GMOs. Although there has been intensive research on quality hatchery production, the use of biotechnology related LMOs (Living Modified Organism) is very unlikely for many years, given the current low status of technology in Burma. Introduction of high yielding fishes, such as the African Catfish, into Burma has proven to have negative impacts on domestic fish populations. So far, it appears that Burma has not imported any kind of fish with altered genes. A recently introduced Tilapia has raised questions among local producers given its relatively improved production performance over other species. Introduction of GM-related alien species into coastal waters of Burma through trans-boundary movements remains a possibility. The Fisheries Department is aware of the threats that such alien species can pose to the indigenous fishery populations and is working in collaboration with other relevant agencies to maintain conservation of the biodiversity in Burma's waters.

### **Initiative in ASEAN on the Development of Biotechnology in the context of agriculture related GMOs**

Burma, being one of the members of ASEAN, is included in this project. The main problems that the project will address are inadequacies of technical capability of the new ASEAN member countries to secure safety and minimize risk in utilization of agricultural GMOs. The project will address the main problems of inadequately trained personnel, particularly the lack of competent knowledge and skills to determine appropriate levels of risk and safety for GMO products. The new members countries, including Burma, Cambodia, Lao PDR, and Vietnam, will participate in this project.

The objectives of development of biotechnology for new ASEAN member countries are:

- (a) To introduce basic science and skill in application of biotechnology to enhance the products and quality of agricultural products;
- (b) To provide wider knowledge to technical experts in justification and determination of risks and safety measures on GMO products;
- (c) To support the development of human resources in new member countries by transferring the technology to enable the establishment of capacity building in development of biotechnology.

The ASEAN Secretariat will co-ordinate project activities with the new member countries and submit progress reports to donor agencies. A National project director will be assigned in each new member country for project management and report the progress report to ASEAN secretariat and donor agencies. In Burma, the Department of Agricultural Planning, Ministry

of Agricultural and Irrigation, will be the implementing agency through the assistance of ASEAN Secretariat.

#### **SECTION IV: MARKETING ISSUES**

Currently, it is United States Government policy to not undertake any marketing development or reporting activities within Burma. The current military junta government of Burma is not recognized by the U.S. government as the legitimate government. Stringent sanctions and trade restrictions are in place as a result. No marketing efforts regarding biotechnology have been undertaken.

#### **SECTION V: CAPACITY BUILDING AND OUTREACH**

Capacity building and outreach efforts on agricultural biotechnology remain unexplored, due to the above policy.

#### **SECTION VI: REFERENCE MATERIAL**

National Progress Report submitted to the Third series of Sub Regional Workshops (2003/004), Myanmar (Burma)

Current Status of Biotechnology in Myanmar, by Zaw Lin and Molly Maung, Biotechnology Section, Dept. of Chemical Engineering, Yangon Technological University, Myanmar

FAO documents

#### **APPENDICES**

##### **1) Micro propagation of Crops**

Crop	Technique	Status	Details
Aloe Vera	Micro propagation	-	Fruit Research & Development Center (FRDC)
Banana	Micro propagation	Commercialization	-
-	Micro propagation	-	FRDC
Oil Palm	Micro propagation	-	Embryo culture; FRDC
Orchids	Micro propagation	-	-
Pea nut	Isozymes	-	Cultivar Identification; Central Agriculture Institute
Pineapple	Micro propagation	Commercialization	FRDC
Potato	Micro propagation	-	FRDC

Rice	Isozymes	-	Cultivar Identification; Central Agriculture Institute
Strawberry	Micro propagation	-	FRDC
Teak	Micro propagation	-	Meri stem culture; Central Forest Development Training Center
Sugar cane	Lepidoptera	Experimental phase	Cry gene

## 2) Name of possible GM seeds and importing companies

Tropical Biotechnology Co. Ltd. -

Mahyco Hybrid cottonseeds from India

Magic 1 Short staple cotton

Bounty 3 Medium staple cotton

Cotton white Silk Long staple cotton

Potatoes from India

Hybrid True Potato Seeds (TPS)

Sin Shwe Li, Regional Military Commander, Shan State -

Hybrid Paddy seed (upland and low land) from China

Myanma Agricultural Produce Trading

Hybrid Paddy seed Mya Sein Yaung (from Taiwan (?))

Importer unknown, for opium crop substitution in Wa area–

Upland Paddy seed Da baing Ku (from China) in Wa area, first seeded in 2004, rumored to be successful.

## 3) Biotechnology research/policy

Biotechnology Research Policy	Responsible institutions for biotechnology research in agriculture are the Ministry of Agriculture and Irrigation and the Ministry of Forestry	
Research Capacity	Key Institutions	An overview on agricultural research institutes can be obtained from ASTI data base and from NARS Yezin Agricultural University Myanmar Rice Research Center
	Summary of Major Research Programs	No information on a national research program on agri. biotechnology available: for an overview on agricultural research projects in general see WISARD directory
Biotechnology Regulatory Framework	Bio safety	No information on national legislation related to biotechnology or GMO's available
		Party of the Convention on Biological Diversity and the Cartagena protocol
		Food safety is regulated by Directive No 9



	Food Safety	On General Products Standards (1996) that does not contain regulations on biotechnology: an overview on food safety regulations can be obtained from ECOLEX and FAOlex
	Patents	Patenting is regulated by Myanmar Patents Act (1946); more information on IP legislation can be obtained from the WIPO Guide to Intellectual Property
	PVP	No information on PVP legislation available
Biotechnology Application	There are some applications on the FAO BioDeC data base	

Source: <http://www.fao.org/biotech/inventory> (under development)

End of Report.